

**A HEEL PROTECTOR****FIELD OF THE INVENTION**

5 The present invention relates to a heel protector and, more particularly, to a heel protector adapted to maximally prevent friction between a user's heel and shoes, and to prevent formation of calluses and blisters on the heel caused by the friction.

**BACKGROUND OF THE INVENTION**

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One of the known arts for maintaining healthy feet is shown in FIG. 11, in which Japanese Utility Model No. 3032803 entitled, "Dryness Preventing Socks," is described. In this Utility Model, the overall border of an inner pad member (520a) attached to a heel is connected to a sock (510a) by stitching (530a) in the shape of the heel. As a result, the overall inner pad member (520a) is secured to the sock and the only effect is to prevent dryness of the heels.

In Japanese Laid-open Patent Application No. 2002-235203, entitled "Dryness Preventing Socks" and illustrated in FIG. 12, formation of calluses caused by dryness of a heel or sole can be prevented by attaching an inner pad member (520b) inside a

sock where the overall border of the inner pad member (520b) is stitched to a sock (510b) to conform to the shape of the heel. As a result, calluses formed by dryness can be avoided. However, formation of calluses or blisters caused by friction cannot be prevented.

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FIG. 13 illustrates a schematic drawing of Japanese Utility Model No. 3021145, the purpose of which is to prevent dryness of feet in the socks. A central portion of an inner pad member (520c) is fixedly stitched (530c) to prevent the inner pad member (520c) from slipping. Thus, it cannot prevent formation of calluses or blisters caused  
10 by friction.

A heel sock for warming feet by way of far-infrared ray disclosed in Japanese Utility Model No. 3018319 and illustrated in FIG. 14 includes a body member (510d) having a cut-off front part and an inner pad member (520d) additionally formed inside the body  
15 member (510d), where a marginal portion and a central portion of an inner pad member (520d) are connectedly sewn (530d) to the body member (510d). Therefore, in this utility model, there is a drawback in that calluses and blisters caused by friction cannot be prevented from being formed.

## SUMMARY OF THE INVENTION

The present invention is disclosed to solve the aforementioned drawbacks and it is an object of the present invention to provide a heel protector configured to maximally  
5 restrict friction generated between a heel and a shoe from occurring while walking, thereby preventing formation of calluses and blisters.

In accordance with a preferred embodiment of the present invention, the heel protector includes a body member made of a flexible fabric material for being worn on the feet  
10 and an inner pad member coupled to an inside of the body member for accommodation to an area where a heel is located when the heel protector is worn, wherein both distal ends of longitudinal direction of the inner pad member are coupled to the body member, and two areas of the inner pad member accommodated to both lateral sections of the heel are coupled to the body member, such that the inner pad member can  
15 relatively slide in relation to the body member when the heel protector is worn.

Preferably, the body member has a cylindrically bent shape.

Preferably, the inner pad member has a substantially oblong shape, and each of the two  
20 areas coupled to the body member is a portion of a lateral distal end of the inner pad

member.

Preferably, the inner pad member is cut in the shape of a “V” at both longitudinal central portions of edges thereof.

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Preferably, the body member is provided with an elastic band at at least one of upper and lower distal ends thereof.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

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For a better understanding of the nature and objects of the present invention, reference should be made to the following detailed description with the accompanying drawings, in which:

15 FIG. 1 is a perspective view of a heel protector according to an embodiment of the present invention;

FIG. 2 is a perspective view of the parts of the heel protector of FIG. 1 before installation;

FIG. 3 is a perspective view of a heel protector according to another embodiment of the  
20 present invention;

- FIG. 4 is a perspective view of a heel protector according to still another embodiment of the present invention;
- FIG. 5 is a perspective view of a heel protector with the inner surface turned out according to the present invention;
- 5 FIG. 6 is an operational view of a heel protector according to the present invention;
- FIG. 7 is a schematic view for illustrating a connected section between a body member and an inner pad member inside a heel protector according to the present invention;
- FIGS. 8 to 10 are perspective views of a heel protector according to still a further embodiment of the present invention; and
- 10 FIGS. 11 to 14 are perspective views illustrating the prior arts.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

The preferred embodiments of the present invention will now be described in detail with reference to the annexed drawings, where the present embodiments are not  
15 limiting the scope of the present invention but are given only as an illustrative purpose, and throughout the drawings, like reference numerals are used for designation of like or equivalent parts or portions for simplicity of illustration and explanation.

20 Referring to FIGS. 1 and 2, a heel protector (10) according to the present invention

includes a body member (100) and an inner pad member (200).

The body member (100) has a cylindrically bent "L" shape and is made of a flexible fabric material. In other words, the body member (100) has a shape of a sock cut out at  
5 a front section thereof. A user may wear the body member (100) just like a sock or may insert the body member (100) inside a sock to encompass the heel of the user.

It should be appreciated that although a so-called ankle protector having its front portion cut off will be explained hereinafter, it is evident to those skilled in the art that  
10 the present invention can be applied to a sock with its front portion stitched, and it belongs to the protective scope of the present invention. In other words, when an opening of the front section of the body member (100) in FIG. 1 is sewn up to look like a regular sock, the sewn-up sock belongs to the protective scope of the present invention.

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Furthermore, the inner pad member (200) of a substantially oblong shape for accommodation to an inside of the body member (100) is coupled to an inner section of the body member (100) for being snugly fitted to the heel when the sock is worn.

20 Although the inner pad member (200) is described to have a substantially oblong shape,

it should be appreciated that the shape of the inner pad member does not limit the scope of the present invention as long as it teaches a hereinafter-described technical characteristic in relation to a coupled shape between the inner pad member and the body member.

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The inner pad member (200) and the body member (100) are sewn for coupling therebetween. In other words, both longitudinal distal ends of the inner pad member (200) are stitched to the body member (100) to allow the inner pad member (200) and the body member (100) to be stitched along the stitching line (210). Furthermore, a  
10 part of both lateral distal ends of the inner pad member (200) are connected to the body member (100) via thread rings (400). The thread ring (400) serves to tie the inner pad member (200) and the body member (100) for being snugly fitted to both lateral ends of the heel.

15 Referring now to FIG. 7, both longitudinal distal ends of the substantially oblong inner pad member (200) are sewn to the body member (100) by the stitching line (210). Furthermore, central marginal sections in the longitudinal direction of the inner pad member (200) are tied to the body member (100) by the thread rings (400) such that sections to which the body member (100) is not affixed can be relatively moved in the  
20 opposite direction against the body member (100). The central marginal section is a

part of lateral distal ends of the inner pad member (200) and corresponds to an area of the inner pad member (200) accommodated to a lateral section of the heel.

It is preferable that the inner pad member (200) is loosely connected to the body member (100) in order to promote a relative smooth movement between the inner pad member (200) and the body member (100).

A predetermined space is formed between longitudinal distal end of the inner pad member (200) and distal end of the body member (100) as shown in FIG. 1, and a longitudinal distal end of the inner pad member (200) and a distal end of the body member (100) may be directly connected as illustrated in FIG. 3.

Referring now to FIG. 4, a band (300) for maintaining elasticity may be disposed at an upper end or a lower end of the body member (100) in order to increase comfort and stability in wearing the heel protector (10). An ankle can be protected by the band (300) that wraps and applies pressure to the upper and lower ends of the heel. The band (300) at the lower end of the body member (100) can further produce an effect of applying pressure to the sole for remedial treatment.

Now referring to FIG. 5, which illustrates a perspective view of the heel protector with



the inner surface turned out, the body member (100) is made of a flexible fabric material and is formed at both distal ends thereof with a band (300). An inner pad member of a substantially oblong shape is sewn along a stitching line (210) and both distal ends of the body member (100). Furthermore, the band (300) and the body member (100) are coupled by said stitching line (210).

As illustrated in FIG. 5, a predetermined amount of space is formed between the inner pad member (200) and the body member (100) before the heel protector is worn, and when the heel protector is worn by a user, the body member (100) is stretched or expanded to fit the shape of a foot and the inner pad member (200) is accommodated to the heel.

Preferably a predetermined amount of space is formed between the inner pad member (200) and the body member (100) even after the heel protector is worn such that a smooth sliding can be effected between the inner pad member (200) and the body member (100).

According to the preferred embodiment of the present invention, the body member (100) is made of 55% nylon/spandex and 45% cotton. The area contacting the body member at the inner pad member (200) is made of 100% polyester while the area of

the inner pad member (200) accommodated to the heel is made of fabric woven with micro polyester.

5 The heel protector according to the embodiment of the present invention is configured such that free movement can be effected between the body member (100) and the inner pad member (200) due to less friction while greater friction is produced at an area where the inner pad member (200) and the heel are mutually contacted, thereby preventing the heel from slipping with the inner pad member (200).

10 Furthermore, soft and supple artificial fur made of micro polyester is used for an area contacting the heel at the inner pad member (200) to increase friction with the heel and to prevent occurrences of skin damage, whereby a comfortable feeling created by warmth and softness can also be provided when the heel protector according to the present invention is worn.

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FIGS. 8 to 10 illustrate still a further embodiment where all constructions are the same as those of the previous embodiments except for a 'V' cut-out at each marginal center of the inner pad member (200) such that the inner pad member (200) can be easily folded at the cut-out section. In this case, inclined surfaces of the 'V' cut-out section  
20 overlap each other to be coupled to the body member (100) via the thread ring (400).

The operation of the present invention will now be described with reference to FIG. 6.

When a user wears the heel protector of the present invention on his or her foot, the  
5 heel of the foot is snugly fitted to the inner pad member (200) while other areas of the  
foot are supported by the body member (100). A predetermined amount of space is  
preferably formed between the inner pad member (200) and the body member (100)  
for a smooth sliding therebetween. Preferably, a material of one surface of the inner  
pad member (200) contacting the heel has a greater friction force while a material of  
10 the other surface of the inner pad member (200) and a surface material of the body  
member (100) contacting thereto have less friction force therebetween. The user may  
wear a sock on top of the heel protector.

When the user walks in shoes with the heel protector (10) on, feet move inside the  
15 shoes according to the movement of the feet. Conventionally, friction caused by the  
movement of the feet directly or indirectly generates calluses or blisters on the heel of  
the feet. However, when the heel protector (10) of the present invention is worn,  
friction is generated between the inner pad member (200) and the body member (100)  
while walking (as shown in an enlarged, detailed view of FIG. 6), and the heel moves  
20 simultaneously along with the inner pad member (200) such that no direct friction is

generated on an area of the heel where calluses or blisters were formed in the past. As a result, calluses and blisters are effectively prevented from being formed at the bottom of the heel.

- 5 Although not illustrated in the drawings, there is another advantage in the heel protector of the present invention in that the same operation is applied to the Achilles' tendon at an upper part of the heel such that blisters prone to be formed by the friction with a shoe can be prevented. Blisters can be effectively prevented especially when a new pair of shoes are worn. Although FIG. 6 shows only a case of back and forth  
10 movements, the same effect can be obtained for left and right movements.

Both longitudinal distal ends and a part of both lateral distal ends of the inner pad member in the heel protector according to the embodiments of the present invention are affixed to the body member such that the inner pad member (200) and the heel are  
15 simultaneously moved at an area where the heel is substantially accommodated and calluses and blisters can be formed.

Subsequently, the inner pad member (200) wraps around the heel of the user to thereby restrict friction from occurring between the heel and the inner pad member (200), and  
20 friction caused by sliding is generated between the inner pad member (200) and the

body member (100) to effectively prevent formation of calluses or blisters caused by the friction between the heel and the shoes.

The inventor of the present invention has discovered that the result of this operation is most effectively accomplished in the heel protector where both longitudinal distal ends and a portion (an area where both lateral ends of the heel are accommodated) of both lateral distal ends of the inner pad member are affixed to the body member (100).

In other words, only some parts (400) of both lateral distal ends of the inner pad member (200) are affixed to the body member (100). Therefore, movement of the inner pad member (200) in relation to the body member (100) can be maximally guaranteed, compared to a case of the entire border of the inner pad member (100) being coupled to the body member (100). Furthermore, when compared to a case of only both longitudinal distal ends of the inner pad member (200) being coupled to the body member (100), a user can easily wear the heel protector, and problems of the inner pad member being folded or the position of the inner pad member not being fixed can be addressed. Still furthermore, the heel protector can be manufactured with a simple construction to enable to simplify the manufacturing process and reduce the manufacturing cost.

The inventor conducted clinical demonstrations by having a user wear the heel protectors according to the embodiments of the present invention. A test was conducted on fifteen male Ssirum (Korean wrestling) athletes and ten male adults in which they walked 80 kilometers for three nights and four days wearing the heel  
5 protectors (20 kilometers per day totaling 32 hours). Even after the long and tedious walks, no problems were found on the skins of the heels. In other words, calluses or blisters were not found on the skins of the heels. Furthermore, it was also verified that the heel protectors had supported the ankles to provide the wearers psychological comfort, without resulting in sprained ankles.

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The heel protectors according to the embodiments of the present invention are useful to professionals including athletes, soldiers and the like who are frequently on their feet. The formation of calluses or blisters can be effectively prevented by the heel protectors of the present invention even for the general public when they work out,  
15 climb mountains or go for a walk.

The foregoing description of the preferred embodiments of the present invention has been presented for the purpose of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and modifications  
20 and variations are possible to those skilled in the art in light of the above teachings or

may be acquired from practice of the invention. It is intended that the scope of the invention be defined by the claims appended hereto, and their equivalents.

As apparent from the foregoing, there is an advantage in the heel protector according  
5 to the embodiments of the present invention in that friction generated on heels while walking can be subdued by an inner pad member to thereby prevent formation of calluses or blisters. There is another advantage in that the configuration thereof simplifies the manufacturing process and reduces the manufacturing cost.